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AUTHORITY

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AUTHOR: (8) Yaroshek, A. D.

TITLE: (6) Method and apparatus for testing the quality of external active layers of machine components without destroying them

PERIODICAL: (15) Akademiya nauk Ukrayins'koyi RSR. Instytut mekhaniky. Prykladna mekhanika, v. 8, 5, 1962, 552-555 pp.

TEXT: The above method and apparatus have been developed at the Institute of Mechanics, AS UkrSSR. Tests are carried out in weak electromagnetic fields, first to a depth of 15 microns, increasing gradually to 300 microns. The range of frequencies used is 30.10^3 to 4.10^6 c/s. A pick-up moves along the surface of the component and induces eddy currents in the external layer, causing variations in the parameters of the pickup coil. From these variations the presence of inhomogeneities in the layer can be determined. The measuring circuit is described. The measured quantities are the resonance voltage U and the resonance capacity C. The pickup can be

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raised above the surface up to 20 microns at high frequencies and up to 150 microns at low frequencies without affecting the measurement. The error does not exceed 0.5% in many cases and the duration of measurement is 10-15 sec. The whole apparatus consists of a stabilizer, current generator, measuring device for U and capacitor box. It is assembled as an instrument 'Defectoscope Д-3 (D-3)'; dimensions are 450 x 290 x 260 mm and weight approximately 15 kg. In addition, four types of pickups have been developed: 1) one having a special core made of carbonyl iron, inside which is placed the inductance coil, this type being used for testing cylindrical components; 2) a similar type used for testing components of complex shape; 3) a small-size pickup whose sensing element consists of a core of nickel-zinc ferrite ф-600 (F-600) of a special shape, and a coil; this type is used for testing very small areas; 4) a pickup with directed sensitivity characteristic, producing eddy currents flowing along a rectangle. There are 3 figures.

ASSOCIATION: Instytut mekhaniky AN USSR (Institute of Mechanics, AS UkrSSR)

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